DOCUMENT RESUME

ED 125 740 PS 008 592

TITLE	Demonstration and Research Center for Early Education (DARCEE). Program Report.
INSTITUTION	Far West Lab. for Educational Research and Development, Berkeley, Calif.; George Peabody Coll. for Teachers, Nashville, Tenn. Demonstration and Research Center for Early Education.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C.
PUB DATE	Nov 71
NOTE	41p.; For related documents, see PS 008 593-603
EDRS PRICE	MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS	Administration; Costs; Early Childhood Education; Instructional Materials; Learning Activities; *Low Income Groups; Objectives; *Parent Education; Parent Participation; *Preschool Education; Preschool Evaluation; *Preschool Programs; Professional Training; *Program Descriptions; Program Development; Program Effectiveness; Program Evaluation
IDENTIFIERS	*DARCEE; Demonstration and Research Center Early Education; George Peabody College for Teachers; Tennessee (Nashville)

ABSTRACT

This document is the first in a series of 12 early childhood program descriptions compiled by the Far West Laboratory for Educational Research and Development. The program described here is the Demonstration and Research Center for Early Education (DARCEE) which was established at the George Peabody College for Teachers in Nashville, Tennessee, in 1966. The DARCEE project has developed a preschool program for 3-, 4-, and 5-year-old children from low-income homes and a training program for their parents. The program is largely teacher directed and focuses on the skills and attitudes necessary for children to succeed in later grades. Parents are trained, either by a home visitor or at the demonstration school, to use common household items as teaching tools and everyday home situations as opportunities for teaching skills. A number of evaluation studies have been conducted to test the effectiveness of the program. Included in the program description are brief outlines of: (1) goals and objectives, (2) content and materials, (3) classroom activities, (4) parent involvement, (5) professional and paraprofessional training, (6) administrative requirements and costs, (7) program development and evaluation, and (8) program history and present (1971) status. (JMB)

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Early Childhood
Information Unit
November 1971

Program Report

DEMONSTRATION AND RESEARCH CENTER FOR EARLY EDUCATION (DARCEE)

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PS 008592

Published by
Far West Laboratory for Educational Research and Development
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Produced by FAR WEST LABORATORY FOR EDUCATIONAL RESEARCH AND DEVELOPMENT, a nonprofit public organization supported in part by funds from the United States Office of Education, Department of Health, Education, and Welfare.

The Laboratory was established through a Joint Powers Agreement in February 1966. Signatories as of October 1971 include:

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TABLE OF CONTENTS

Summary

Goals and Objectives 1
For whom is the program designed? 1
What are the goals and objectives of the program? 1
What is the rationale for the program emphasis and design? 4

Content and Materials 6
How is the program designed to be used? 6
What skills, concepts, and attitudes are to be learned? 6
How is the curriculum organized? 10
What student materials are provided or suggested? 11
What materials are provided or suggested for the teacher? 13
What materials are provided or suggested for student testing? 13

Classroom Activities 14
What is the teaching/learning strategy? 14
What classroom organization is best suited to this program? 15
How are students evaluated? 16
What is a representative lesson? 16

Parent Involvement 18
To what extent are parents involved? 18
What materials are available for training parents? 20

Professional and Paraprofessional Training 21
What skills or knowledge do professionals require? 21
Are training programs available for professionals and paraprofessionals? 21
What materials are available for professional and paraprofessional training? 21

Administrative Requirements and Costs 22
What facilities and physical arrangements are needed or recommended? 22
What special equipment is needed or recommended? 22
What professional and paraprofessional personnel are needed or recommended? 22
What does it cost to implement the program? 22
Are the curriculum materials available? 23

Program Development and Evaluation 24
What is the research base for the program? 24
How was the program developed and tested? 26
What evaluation studies have been conducted? 27

Program History and Present Status 31
What is the history of the program? 31
What is the present state of development? 33

Selected References 34

Summary

The Demonstration and Research Center for Early Education (DARCEE), established in 1966 at George Peabody College for Teachers in Nashville, Tennessee, has three major goals: research, demonstration, and training in early education. Over the years, DARCEE has developed a preschool program for three-, four-, and five-year-old children from poor homes and a training program for their parents. Susan Gray, the director of DARCEE, points out that no school program for children can carry the whole burden of averting the detrimental effects of poverty. The home environment, and more specifically, the quality of interaction between parent and child, is equally important in laying the groundwork for future progress. Thus the parent training program is considered an integral part of the total program.

The school program focuses on the development of skills and attitudes that are necessary for children to succeed in later grades. Skill objectives are broken down into three major categories: sensory or input skills, abstracting or mediating skills, and response or output skills. Within each major skill objective are sub-skills broken down into small learning steps. Unit themes such as "Home and Family" or "All About Me" provide the context in which skills are presented. For example, in the unit "All About Me," preschoolers learn to label body parts and use these labels to communicate. Attitudes such as positive self-identify and independence are also considered necessary ingredients for later success. The program is largely teacher-directed; that is, learning activities are planned and presented by the teacher or aide rather than selected by the students. The teacher follows suggested activity guides developed by DARCEE.

Parents may be trained by a home visitor or at the demonstration school. In both home and school settings, parents are trained to use common household items as teaching tools and to use everyday home situations as opportunities for learning skills.

A number of evaluation studies have been conducted by DARCEE to test the effectiveness of the program. According to Susan Gray, results from recent studies were "modest but gratifying." Of particular interest is a longitudinal study of the original DARCEE graduates from 1963 to 1968. Test scores on the original 88 DARCEE

graduates were obtained through fourth grade, long after these children had left DARCEE and entered the public schools. This study showed that there were increases in intelligence and achievement scores during the first year and that these increments were maintained through first grade. However, between second and fourth grade there is a "slight but parallel decline" in test scores. Gray stated that the DARCEE program should not be conceived of as "a form of inoculation whereby the child forever after is immune to the effects of a low income home and of a school inappropriate to his needs." However, she is cautiously optimistic about the positive effects of the DARCEE program which studies seem to indicate. It is, then, the responsibility of the public schools to provide a learning environment that will sustain the growth initiated by an early education program.

GOALS AND OBJECTIVES

For whom is the program designed?

The program of the Demonstration and Research Center for Early Education (DARCEE) is designed for preschool children of low-income, so-called "disadvantaged" family backgrounds. The initial project focused on black children of a southern small town. Subsequently, white, black, Indian, and mixed groups have attended the three DARCEE centers in Nashville and rural Tennessee, and classrooms based on the model in urban and rural areas around the country. The majority of children enrolled in the demonstration center on Peabody campus are AFDC recipients from father-absent homes.

What are the goals of the program?

Goals of the curriculum. DARCEE's goal is to teach the skills and attitudes which the developers believe essential to success in school. Skill and attitude development are given equal importance. In speaking of "skills" DARCEE also includes concept development. These are skills and attitudes which, according to the developers, most middle class children acquire before entering school but which low-income children generally lack. The DARCEE model is designed to overcome this handicap.

Following is a summary of DARCEE's description of their skill objectives:

1. Sensory skills. These are the perceptual or "input" skills, the processes by which environmental stimuli are received and decoded through the senses. There are four groups of sensory skills:

   a. Orienting and attentional: the basic learning skill by which the child focuses upon relevant stimuli such as color, shape, size, etc.

   b. Discriminatory: the ability to perceive likenesses and differences between stimuli.

   c. Relational: the ability to deal with interrelated stimuli which are received simultaneously; for example, the ability to solve a puzzle by perceiving the relationships among the parts.

d. Sequential: the ability to perceive a repeating patterning of stimuli which occur in a certain spatial or temporal order.

2. Abstracting and mediating skills.

a. Basic concept development: includes such concepts as color, shape, size, number, position, volume, texture, weight, temperature, motion, speed, taste, time, age, affect (the concept of "sad," "happy," etc. related to facial expressions).

b. Association: the ability to build connections between objects, events, and concepts related spatially, temporally, or functionally; to associate labels with objects, sounds, concepts, etc.; to associate basic concepts; to develop higher level concepts, such as that of an animal, from basic concepts such as color, shape, size, etc.

c. Classification: the ability to group objects and concepts sharing a common characteristic. Includes the ability to sort objects with a common characteristic into given categories, and to abstract the shared characteristic of given objects and formulate the class to which they belong.

d. Sequencing skills: includes motor sequencing (e.g., the ability to carry out a series of directions) and verbal sequencing (e.g., the ability to verbalize the serial order of numbers, days of the week, seasons, events in a story, events in a day).

e. Critical thinking: the ability to draw relationships, make inferences and predictions, analyze problem situations, synthesize ideas, hypothesize, evaluate, draw analogies, and analyze absurdities.

3. Response skills.

a. Verbal: fluency, articulation, and sentence structure.

b. Motor: hand-eye coordination and orientation (left-to-right, top-to-bottom, front-to-back).

DARCEE also has as objectives the development of the following attitudes believed related to school success:

1. Positive self-identity
2. Independence
3. Persistence
4. Ability to delay gratification
5. Interest in school activities
6. Trust in the predictability of adults in the classroom and in the classroom environment
7. Identification with achieving adult role models
8. Ability to follow directions
9. Positive attitude toward own and other social (including ethnic) groups
10. Sportsmanship: taking turns, sharing, accepting the fact that one cannot always win

The purpose of each activity is to develop one or more skills or attitudes. Objectives for activities are stated behaviorally. "To classify animals into sets according to common characteristics of homes and characteristics of bodies" is the objective of one activity here. The child is expected to sort cards into sets representing animals that are, for example, fur-bearing or feathered, two- or four-legged, and that live in caves or nests.

Goals of the parent-involvement component. A parent-training component is half of the DARCEE plan. Parent training may be conducted through either a home visitor program or regular sessions at the preschool. (For details, see Parent Involvement.) The goal of the parent training program is to improve the child's home

learning environment--to help the mother teach her own child the attitudes and skills described above with a view also to benefiting younger children in the family. More specifically, the home visitor program is intended to:

1. reinforce at home what the child learns in school;

2. make the parent aware of the "instrumental steps" necessary to the child's success in school and the importance of that success to his later life;

3. promote in the parent a sense of self-worth and competence, and a sense of the worth of the child.

To fulfill these goals, the home visitor concentrates on teaching specific techniques to use with the child, on raising the parent's aspirations, and on raising the parent's sense of adequacy.

What is the rationale for the program emphasis and design?

The rationale that the DARCEE developers give can be summarized as follows:

Children of low-income families tend to lack certain skills and attitudes essential for school success, and which middle class children generally possess at the time they enter school. The development of perceptual and conceptual skills is stunted by an environment which is often disorganized, cluttered, and noisy, and which, while offering abundant stimuli, does not provide spatial and temporal organization ("nothing is ever in an assigned order and nothing takes place at an assigned time"). The home lacks books and writing and drawing materials to encourage interest in school-type materials and activities. The mother is apt to be home infrequently and her energies "so drained into maintaining a subsistence level in the home that she has little energy left over for patterning her child's behavior." She directs her attention more "toward inhibiting behavior than . . . towards encouraging exploratory behavior." Such an environment also discourages the development of achievement attitudes. The child usually has no adult "achieving role model" to imitate and little reason to develop a positive self-image.

The developers' justification of their one-year program is stated in a DARCEE brochure as follows:

> A structured program, in which each activity is planned for a specific purpose is necessary because there is so little time in one year before first grade to overcome the learning deficiencies of disadvantaged children. Obviously the undirected years of their growth have not done the job. We have the pragmatic evidence of objective tests that for these children a structured program achieves results. Whether the progress prevails over time is another question--one to be answered as we follow our former DARCEE children through school.

In another article, Dr. Susan Gray, project director, states:

> We cannot assume that in the framework of a traditional program these skills for achievement would develop. This view would be a romanticism which we cannot afford. Our program is designed to meet the particular needs of our children. Rather than accommodating our objectives to match their particular learning deficits, we have established a high goal: to take their very skill weaknesses and develop them into competencies for coping with the environment.

The rationale behind developing a parent training component was that the mother's role is crucial in the child's skill and attitude development. She can also reinforce the teaching of the preschool. The developers maintain there is strong evidence of "vertical diffusion" (an effect on younger children in the same family) and some "horizontal diffusion" (to the community), which have resulted from their parent training program. They believe that an important aspect of the parent training component, therefore, is its widespread effects for a modest cost. (See Parent Involvement.)

CONTENT AND MATERIALS

How is the program designed to be used?

DARCEE is a preschool or Head Start program. The program is operated for 40 weeks, five days a week, four hours a day. The developers have also used a two-year plan. No time limits are set for the home visitor or classroom training program for parents, but parents generally continue in them as long as their children are in the DARCEE preschool.

What skills, concepts, and attitudes are to be learned?

The DARCEE approach is designed to teach skills rather than subject matter and, equally important, the attitudes the developers believe to be related to success in school. The developers identify three classes of skills which they believe to be essential to later scucess in school: sensory (perceptual) skills, abstracting and mediating (conceptual) skills, and response skills.

DARCEE provides the following chart of skills: (For an explanation of the categories see Goals and Objectives.)

1. Sensory Skills

    a. Orienting and attentional
        - Visual
        - Auditory
        - Tactile-kinesthetic
        - Taste-olfactory

b. Discriminatory
   - Visual
   - Auditory
   - Tactile-kinesthetic
   - Taste-olfactory

c. Relational
   - Visual
   - Auditory

d. Sequential
   - Visual
   - Auditory

2. Abstracting and Mediating Skills

a. Basic concept development

Color	Pitch	Speed
Shape	Length	Taste
Size	Volume (sound)	Flavor and odors
Number	Texture	Time
Position	Temperature	Affect

b. Association

Objects with objects: functionally, spatially, temporally
Labels with objects (e.g., the word "clock" with a clock), sounds, actions, concepts
Labels with labels (e.g., matching one card printed "clock" with an identical one)

c. Classification

Deductive classification
Inductive classification

d. Sequencing

Motor: sequencing a series of actions, directions, events
Verbal: sequencing a series of concepts, events

e. Critical thinking

Drawing relationships
Making inferences
Making predictions
Analyzing problem situations
Synthesizing ideas
Hypothesizing
Evaluating
Drawing analogies
Analyzing absurdities

3. Response Skills

a. Verbal

Fluency
Articulation
Sentence structure
a. single-word level: identification of objects, actions, sounds, concepts

b. phrase level
c. complete sentence level
   - simple declaratives
   - interrogatives
   - negatives
   - "and" statements
   - "or" statements
   - "if-then" statements
   - "I don't know" statements
   - complex sentences with adverbial clauses

b. Motor

Small-motor coordination (eye-hand coordination)

Pasting	Cutting
Modeling	Lacing and Weaving
Painting	Tracing
Coloring	Solving Mazes
Stringing	Following Dots
Drawing	Printing

Orientation
- Left-to-right progression
- Top-to-bottom progression
- Front-to-back progression

The developers identify the following attitudes as equally important to achievement. DARCEE attempts to develop these attitudes in an informal, on-going manner.

1. Positive self-identity
2. Independence
3. Persistence
4. Ability to delay gratification
5. Interest in school activities
6. Trust in the predictability of adults in the classroom and in the classroom environment
7. Identification with achieving adult role models
8. Ability to follow directions
9. Positive attitude toward own and other social (including ethnic) groups
10. Sportsmanship: taking turns, sharing, accepting the fact that one cannot always win

The skills listed in the charts are further broken down into specific objectives for each activity. For example, under Basic Concept Development (in Abstracting and Mediating Skills), "color" is broken down into specific colors such as red, blue, or yellow.

How is the curriculum organized?

Skill development is organized around unit themes such as "Autumn" or "Home and Family" on the assumption that a theme makes learning more meaningful to the child. The developers also believe that a unit sequence helps the teacher present the learning situations in order of increasing difficulty, provided the directions for sequencing skill development are followed. The activities for each unit are also sequenced according to difficulty.

The staff recommends that teachers sequence units differently for different groups of children. The first units always deal with themes considered familiar to the child. Later, units move to more unfamiliar topics. One arrangement of the units to be published, moving from familiar to more unfamiliar topics, might be the following: All About Me, Plants, Autumn, Home and the Family, Winter, Forest Animals, the Neighborhood and Community, Transportation, Spring, Farm Animals and Farm Crops.

What student materials are provided or suggested?

The program emphasizes extensive handling of manipulative materials by the child. The materials are not unusual. Most of them are standard items in any preschool. However, the developers state that they have found many new ways to use materials--always for specific instructional purposes. For example, children are given pegboards, beads, and blocks to learn colors, positions, the meaning of "diagonal," and for "patterning" (reproducing a pattern from a model). DARCEE also uses teacher-made materials (and, in the parent-training program, parent-made toys) such as flannel board story sets.

No student materials are directly available from DARCEE. However, the developers provide the following list of some recommended materials:

MATERIALS	NO. OF ITEMS OR SETS	COMPANY AND NUMBER
Flannel board	1 (2'x3' or 3'x4')	Instructo, No. 8 or 9
Peg boards	10	Milton Bradley, No. 474x
Pegs (assorted colors)	1000-2000	Milton Bradley, No. 472x
Beads	3-4 boxes	Milton Bradley, No. 470F
Cubical counting blocks	2-3 boxes	Milton Bradley, No. 8039
Parquetry blocks (small)	4 boxes	Milton Bradley, No. 8439
Parquetry blocks (large)	2-3 sets	Playskool, No. 306
Puzzles (sequenced in difficulty from 4-30 pieces)	20	Playskool, Judy, Sifo
Primary cut-outs (for flannelboard)	1 set	Instructo, No. 104
Kinder School Blocks/(wooden unit blocks)	86	Sifo, No. 167
Rig-A-Jig	2 deluxe sets	Lanfield Co., No. 300

MATERIALS	NO. OF ITEMS OR SETS	COMPANY AND NUMBER
Teaching Pictures:		David C. Cook Publishing Co.
Food and Nutrition	1	No. A1532
Science Themes No. 1	1	No. A891
Science Themes No. 2	1	No. A1556
Seasons	1	No. A865
A Trip to the Farm	1	No. A1535
A Trip to the Zoo	1	No. A1534
Lotto Games:		Ed-U-Cards
Farm Lotto	2	No. 104
The World About Us Lotto	2	No. 115
Go-Together Lotto	2	No. 121
Object Lotto	2	No. 127
Peabody Language Development Kit, Level #P or Level 1	1	American Guidance Service, Inc.
Language--Kit A	1	Ginn and Company
Housekeeping Center	1	
Full-length mirror	1	
Telephones	10	Bell Telephone Co. (free)
Model vehicles (wooden and plastic)	10	
Rhythm instruments	10	
Dress-up clothes (male and female)	20	
Record player--in good working condition	1	

In addition, the classroom should have a variety of records, to include stories, rhythm music, and songs, which are appropriate for the cultural background and experience of the children. The Golden Book and Record Sets (69¢) by Golden Records are recommended as inexpensive records (with small Golden Book) of classic stories. Bowman Record, Inc. and Concept Records, Inc., are two companies which have records for skill and concept development.

There also should be a variety of story books appropriate for preschool children, plus books for the development of concepts pertaining to the self, home and family, neighborhood and community, seasons, pets, farm animals, and forest animals to use with the unit topics.

What materials are provided or suggested for the teacher?

Paperback guides to teaching four of the units -- All About Me, Autumn, Home and Family, and Farm Animals -- are available from DARCEE. Seven others are expected to be ready by late 1972. There is also an introductory manual which contains an overview of the program, the rationale, a suggested sequence for the units, a list of recommended materials, and references. Each unit guide, or "resource unit," contains the concepts and skills to be developed, instructional activities, and patterns for teacher-made materials. Activities are described in narrative form followed by evaluation suggestions, such as questions the teacher might ask or follow-up exercises, and an extension activity.

What materials are provided or suggested for student testing?

The developers state that continual evaluation of students is an important aspect of the DARCEE model. DARCEE teachers use a 22-page Child Evaluation Form for recording each child's development in each skill area. Among the areas listed under "Perceptual and Conceptual Development" on this form are these: color concepts (broken down into 20 colors), shape concepts (such as straight and curved lines, triangles and squares, cubes and cylinders), number concepts, (e.g. "ability to identify sets up to ___"), size concepts (little, littler, littlest; thin, thinner, thinnest), and measurement concepts (inch, gallon, etc.). Under "Language Development" are listed auditory discrimination skills (such as the ability to recognize rhyming words) and verbalization skills (for example, the use of past and future tenses). (See also "How are students evaluated?" under Classroom Activities.)

CLASSROOM ACTIVITIES

What is the teaching/learning strategy?

The DARCEE instructional strategy is to build skills sequentially and step by step, while also encouraging the child to develop desired attitudes. Each skill is developed through a sequence moving from gross to fine discrimination, concrete to abstract, simple to complex, and sensory-motor to conceptual-verbal. Every activity is designed to develop one or more aspects of specific skills and attitudes. (However, the choice and sequencing of activities for the development of a given skill is left to the teacher.) For example, to develop visual discrimination a child might be given a jigsaw puzzle to put together. When he masters a skill at a simple level he proceeds to a more complex level. For example, when he can reproduce pegboard patterns in two colors, he is given a three-color pattern.

Most DARCEE lessons are initiated by the teacher rather than the student and structured to meet specific objectives. That is, the teacher selects activities that will develop certain skills and attitudes. The developers state:

> Each teacher should know the objectives of the program and the abilities of each child in her group. It is her responsibility to provide the "match" between the program objectives and the abilities of each child, by designing activities for her group at the level of "just manageable difficulty." Because of individual and group differences, there is no specific sequence of activities for developing any one skill.

In order for the teacher to continue to match the objectives to each child's level, continuous evaluation and planning is essential.

DARCEE strongly emphasizes teacher-child interaction. Planned reinforcement is especially stressed. Teachers use "selective" reinforcement. That is, when a child can accomplish a task easily, he is no longer praised for it but rather for a new a more difficult task that he demonstrates he can perform. At the same time,

the form of the reinforcement changes. Initially the children may be rewarded with candy, later with stars and check marks, later only with praise, but the ultimate objective is to have the child develop a sense of self-satisfaction as his own reward.

What classroom organization is best suited to this program?

The DARCEE classroom is staffed by one professional teacher (the "lead teacher") and one or more teaching assistants. Originally, the DARCEE center classroom had four teaching assistants and one lead teacher for twenty children, but in the 1970-71 school year, there were two assistants. In 1971-72 there will be one assistant and one lead teacher for sixteen children. (Teaching assistants at the DARCEE centers are "primarily at a sub-professional level, or are career trainees obtaining their practicum experience.") The lead teacher conducts the class during periods when all the children meet together, usually twice a day. The rest of the day, she and the assistants teach small groups of approximately five to eight children.

The developers feel that a low pupil-teacher ratio and a professional teacher free to observe and assess class process are necessary in a program built upon careful skill development and evaluation.

22

The DARCEE Early Training Centers (demonstration schools, two in Nashville, one in rural Tennessee) use the following daily schedule: The day begins with the greeting of each child by the lead teacher, followed by a snack period and informal conversation. Next the children assemble in the large group area. The lead teacher directs this part of the program. Each teaching assistant sits behind five or more children to keep attention focused on the lead teacher and encourage and praise appropriate responses. Time spent in large group activities increases from about ten minutes early in the year to 30 or 40 minutes later on. Two small group activities follow. (Most skill development activities take place in small groups of about five children under the direction of a teaching assistant. Each activity has at least one specific objective: to clarify a concept from the unit topic, to teach a skill, or to develop an attitude such as positive self-concept, motivation to achieve, or persistence.) In a third small group period the children usually choose among four or five activities pre-selected by the teachers. The children are free to move from one activity center to another during this period, but they are encouraged to complete tasks. There is a 30-minute outdoor play time (or physical activity period). After lunch all children return to the large group area for a short review of the day. The teacher asks questions such as: "What did we do first today?" "What came next?" "What did you

enjoy most?" The purpose of the review is to develop a sense of order. After the children leave, the lead teacher meets with the assistant teachers to write evaluation and the next day's lesson plans.

How are students evaluated?

Evaluation is a crucial part of the DARCEE program. Success is defined as the ability to complete a task correctly. The child must demonstrate competence at one skill level before he moves to the next. For example, when he can copy a pegboard pattern with two colors, he is given a pattern with three colors.

Teachers evaluate each child's progress continuously. They observe how he completes each task. The lead teacher's primary function during small group activities is to observe and evaluate. At the end of each day, the staff meets for an evaluation and planning session. The lead teacher and teaching assistants evaluate the group and individual performance during each of the day's activities. On the basis of the daily evaluation and the program objectives, specific plans are made for the next day's activities.

DARCEE teachers use a cumulative Child Evaluation Form to record each child's achievement. The form is a check list of all the skills to be developed, broken down into their smallest components. (See "What materials are provided or suggested for student testing?" under Content and Materials.) Teachers also write a weekly narrative evaluation of each child.

At the DARCEE center children are usually tested twice a year, at the beginning and end of the school year. Tests such as the Binet, the Wechsler (WPPSI), the Peabody Picture Vocabulary Test, ahd Pictorial Test of Intelligence (French), Verbal Language Test (Neville: locally developed), DARCEE Concept Test (Gilmer: locally developed) are used. Usually one general intelligence test, one vocabulary test, and the concept test would be selected.

What is a representative lesson?

The example on the following page is a lesson taken from the teaching unit, *All About Me*. Each lesson is directed to one of the concepts or "understandings" listed as objectives for the unit.

UNIT: UNDERSTANDING: a. The part of us that we see is called the body.
1. Each part of the body has a name.

BASIC SKILLS TO BE DEVELOPED	INSTRUCTIONAL ACTIVITIES

SENSORY SKILLS

Visual Skills
- Focuses attention on the child's body
- Isolates the major parts of the body

Auditory Skills
- Listens to labels for body and parts

ABSTRACTING SKILLS

Conceptual Skills
- Knows concept of body
- Knows major body parts

Association Skills
- Relates each body part with its label

RESPONSE SKILLS

Verbal Skills
- Labels the major body parts
- Repeats complete sentence responses modeled by teacher

Motor Skills
- Locates a body part when named

1. Basic Activity

Using yourself and a child, show the children what is is meant by the label "body." Then focus on the basic parts--head, shoulders, arms, hands, chest, hips, legs, feet. Point to the head of the demonstration child, making sure to indicate the whole head. Ask the children if anyone can name this part of the body. If no one gives the label "head," supply the label. Ask the children to say, "That is a head," or "That is _____'s head." Ask the child to find the same part on your body. Continue this procedure, moving from head to feet. When all the basic parts have been covered, repeat the procedure for any of the parts which were unfamiliar to most of the children.

Assessment Activity

Play recognition game. Ask individual children to come to the front of the room and find a certain part of _____'s body. If any have difficulty, ask other children to assist. When a child locates a part, encourage the child to name it.

A number of suggested extension activities are listed after each lesson.

24

PARENT INVOLVEMENT

To what extent are parents involved?

Parent involvement is one of the two components of the DARCEE program; the other is the preschool program. Believing that the mother's role is crucial in the child's early development, the DARCEE staff has designed a training program to encourage the mother's active interest in her child's education and to equip her with skills to make the home a better learning environment. There are two alternative models for the parent involvement components, the home visitor program and the classroom plan. Either may be selected. The developers have found both effective. (See Program Development and Evaluation for details of evaluation.) Each model is described below.

The home visitor program. Home visitors are usually experienced preschool teachers, but may be trained paraprofessionals. Each home visitor is assigned twenty mothers of DARCEE preschoolers. She works with four a day, either individually or as a group. This plan was put into operation during the Early Training Project (1961), the pilot project of the present program. It has been used in combination with the plan described below and also, for comparison, with parents whose children did not attend an Early Training Center. (See Program Development and Evaluation for results of studies of the home visitor program.) The DARCEE staff is now particularly interested in the effects of the home visitor program on younger siblings of the children enrolled in the program. The developers feel that the home visitor program offers "high yield" at a modest cost since no special facilities or equipment are needed.

The home visitor first tries to develop the mother's feeling of self-worth and ability to teach her child. The visitor tries to convey to the mother that education will increase the child's opportunities and that mothers can play a substantial role in helping him succeed in school.

Later the visitor teaches techniques: how to conduct dramatic activities and counting songs, how to read a story and ask questions about the pictures, ways to use ordinary household items and activities as learning experiences. For example, while getting supper the mother might challenge the child to name vegetables, tell where they come from or how they are cooked, cut pictures of them from magazines. She might ask whether a

potato is hard or soft, or bigger or smaller than one near it, and introduce a new meaning of "eye". Parents are encouraged to take children to the post office, library, or supermarket and to discuss what they have seen. The home visitor tells the mother always to praise the child for answering. She also assigns tasks for the child and mother.

The classroom plan. In the most comprehensive model of this plan, twenty mothers, in groups of four, spend one day a week at the DARCEE Early Training Center. For several months they observe the class from behind a one-way window. Observations are supervised by a trainer who interprets what is going on. After each observation period, the mothers are taught to use some of the materials and techniques of the program. When they have acquired confidence and teaching skills they are introduced into the classroom as participants, first at snack time and later during activities. Eventually, the mothers learn how to plan, implement, and evaluate activities for a small group of children.

The developers describe what happens after observation:

> Afterwards the mothers move to the teachers' room to learn how to use materials such as puzzles and pegboards for specific purposes. They learn to role play both teachers and the children, to ask appropriate questions, and to find answers using appropriate sources. As the mothers gain understanding of the program objectives and develop skills in selecting and using materials to implement objectives, a large portion of the training time is devoted to helping the mothers transfer their new learning from the school to the home setting. The mothers learn to use common household objects as instructional materials and to utilize everyday home situtations for learning. They also make toys and instructional materials using objects which they bring from home. The mother trained often gives the mothers "assignments" to be carried out at home with their children during the week between her center visits. In planning her home activities, each mother learns how to adapt her materials, techniques, and objectives so as to provide a meaningful learning experience for each child in her family, regardless of age or level of development.

Abbreviated forms of both the home visitor program and classroom plan have been used in several DARCEE pro-

jects. DARCEE has also used both plans simultaneously with the same group of mothers during a special research project. In this study a group of twenty mothers, designated the Maximum Impact Group, received both types of training, first the in-school training and later home visitor training. Results of the study, in which Maximum Impact mothers and children were compared with mothers and children trained only in the preschool and with mothers and children trained by a home visitor, are reported under Program Development and Evaluation.

What materials are available for training parents?

No special training materials are available for the classroom plan, but materials for training teaching assistants may be used.

A manual for home visitors is available from the DARCEE Information Office at $2.00. It contains a "how-to-do-it" section, a resource section suggesting activities, a large section of case studies describing how DARCEE home visitors handled specific situations, and a bibliography of suggested readings. This manual is designed initially for instructors of home visitors, who may later use it as a reference in their work. There is also a manual for mothers of infants available.

Few special materials such as commercial toys are used in the program. Instead, mothers are encouraged to make simple materials or use things available in the house, such as frozen food tins for stacking toys.

PROFESSIONAL AND PARAPROFESSIONAL TRAINING

What skills or knowledge do profesisionals require?

Teachers need special training in the DARCEE model. Home visitors also need training in the specific requirements and techniques of their job.

Are training programs available for professionals and paraprofessionals?

DARCEE conducts institutes for teachers. They prefer to train "trainers"--lead teachers--who will return to their schools and train the rest of the staff. Fourteen short term training institutes were held at DARCEE during 1970-71, primarily for different levels of Head Start personnel, and similar institutes will be scheduled for 1971-72. The one-week institutes give only an orientation to DARCEE. A two-week institute for classroom teachers will include limited participation in the Early Training Center along with suggested methods and techniques of teaching. Other training in this series will be planned for home visitors, parent involvement and other personnel.

Paraprofessionals may also attend the short term institutes. However, the developers feel that if the lead teacher is DARCEE trained, she can train her teaching assistants. Conversely, "if a paraprofessional participates in a training program, she is more likely to implement her training if her lead teacher has also been DARCEE trained."

What materials are available for professional and paraprofessional training?

Limited materials for training the classroom teaching assistants and aides are available from DARCEE. A manual for training home visitors is available from the DARCEE Information Office. (See Parent Involvement for a description of the manual.)

ADMINISTRATIVE REQUIREMENTS AND COST

What facilities and physical arrangements are needed or recommended?

The DARCEE program requires space for small groups to work without distracting each other. If the classroom method of training is used (see the Classroom Plan under Parent Involvement), an observation booth with a one-way glass mirror is needed. The DARCEE centers have the floor plan shown on the following page.

What special equipment is needed or recommended?

DARCEE requires no special equipment. Standard preschool furniture and equipment is usually adequate.

What professional and paraprofessional personnel are needed or recommended?

The developers state:

> A DARCEE class of 20 children usually has a staff of five--a lead teacher and four teaching assistants; however, the program has been implemented, with adaptations, in regular Head Start classrooms with a staff of only two--a teacher and one aide.
>
> The home visitor is usually a professional teacher; however, paraprofessionals and trained parents have also been used to train parents.

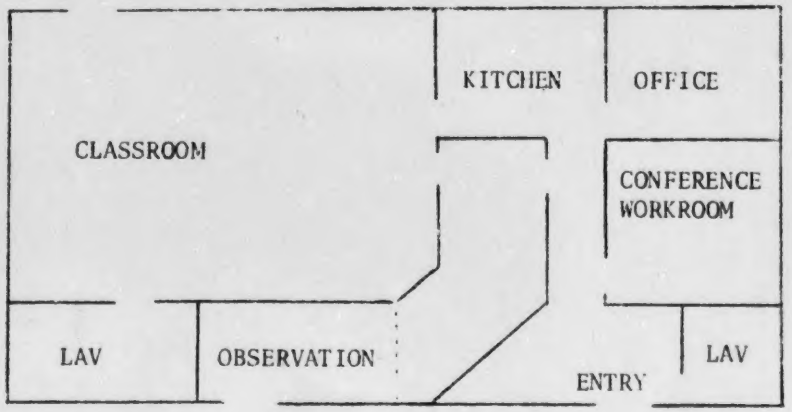
What does it cost to implement the program?

No information is available. Compared to other preschool models, the cost of equipment will probably be about the same or less, since DARCEE uses only standard preschool items and teacher-made materials. The cost of personnel, however, will probably be greater since there is a high ratio of teaching assistants to students.

Are the curriculum materials available?

A manual for home visitors is available at $2.00 from the DARCEE Information Office. Four "resource units," for teaching four of the eleven units, and an introductory manual are available at $1.50 each from DARCEE. The introduction contains an overview and rationale for the program, unit sequencing, recommended materials to purchase, and references. The resource units list concept and skill objectives for the unit, describe suggested activities, and contain patterns for making materials. Seven more resource units are expected to be available by late 1972.

DARCEE FLOOR PLAN



The DARCEE Early Training Center is built according to the plan above, with overall dimensions of 56 by 28 feet. The classroom is 20 by 32 feet. The double lines separating the curved observation room from the classroom indicate sections of one-way glass.

PROGRAM DEVELOPMENT AND EVALUATION

What is the research base for the program?

The program was developed in response to numerous studies indicating that success in school is related to certain attitudes and cognitive skills which most middle class children acquire before school age but which many non-middle class children do not. The developers cite, for example, studies by Benjamin Bloom, Harry A. Passow, Frank Riessman, James B. Conant, and Michael Harrington. The developers contend that the lack of required skills results from the particular "patterns of interaction" of these children with others, most importantly with the mother. Dr. Susan W. Gray, director of DARCEE, wrote in 1965 describing the Early Training Project.

> The procedures we have used in our work with these youngsters grew out of the literature on differences in social class, in child-rearing practices, in motivational patterns, in language, and in perceptual and cognitive development. They were also influenced by our observations of, and speculations upon, the effects of the experiences our children were receiving within their homes.

The developers found that while the impoverished child probably received as much stimulus input as the more privileged, the stimuli were probably less varied and often so conflicting in a noisy, active home that the child "is unable to attend to those stimuli most relevant in terms of increased intellectual development." They concluded that "cultural deprivation, at least as we have used the term, is more likely to arise from the particular patterns of interaction of children with others."

These patterns of interaction have been grouped as five "reinforcement variables" by Dr. Gray:

1. Total amount of reinforcement. Because the low-income mother's time and energy goes primarily into subsistence activities, the child may receive little attention in the form of reinforcement.

2. The source of reinforcement. The lack of reinforcement from adults means that the child receives most of his reinforcement from other children and from his own sensations, such as the pleasure of racing or riding a tricycle.

3. Amount of verbal reinforcement. "Even when the parent is the reinforcing agent, it is likely that there will be much less in the way of verbal responses, particularly of complex ones."

4. The direction of the reinforcement. "In the home where the major concern is copying rather than shaping . . . reinforcement will be given for those behaviors that make coping easier. In a word, children will be rewarded for inhibitory rather than exploratory behavior . . . In such an environment, the 'natural' curiosity of the child may wither for lack of encouragement."

5. The focus of the reinforcement. Generalized approval or disapproval ("You're a good girl," "You're a bad boy") is probably more characteristic of the poor home than more precise reinforcement. As a result, "the child's attention is not directed toward the quality of the performance, nor is it possible for him to become self-reinforcing in terms of evaluating and improving his own performance."

32

In the years since 1965 when these conclusions were drawn, the staff has further researched patterns of interaction. Presently DARCEE is investigating "patterns of interaction" directly in the home environment, utilizing a skilled observer with a portable tape recorded. This project is known as the Ecological Study because it attempts to investigate the total "ecology" of 24 three-year-old children evenly divided among lower income urban, middle income urban, and lower income rural families. During a 30-minute period in the home the observer, using a tape recorder and shielded microphone, records any words or action directed to the child or any interaction between the child and another person. An example of the type of information the study has yielded is the following excerpt from a 1967 report:

> . . . The question we raised at the outset of this study about more frequent occurrence of reinforcement for inhibitory behavior by lower income mothers woul not appear to be more complex than it seemed at first. It may <u>not</u> be that agents in lower income homes tell children to "Go away and leave me alone" more often than do agents in middle

income homes. It may be that the difference lies in what else there is to "go away" to and against what other pressures from the environment these "go away" injunctions occur. It is to these kinds of questions that we plan to address ourselves in the immediate future.

The project is continuing, but a report of findings to date is unavailable.

How was the program developed and tested?

The DARCEE model was initially developed in the Early Training Project begun in 1961 with an all-black group of 60 three-year-olds in Murfreesboro, Tennessee. (See Project History and Present Status for details of this project.) One product of this project was a manual, Before First Grade (Gray, Klaus, et al., 1966), which sets forth the skills and attitudes to be taught, suggests activities for teaching them, and contains a few sample lessons for use in replicating the model.

Subsequently DARCEE was established at Peabody College and funded by the Office of Education and Office of Economic Opportunity to do research, training, and demonstration in early education. An important part of this mission was to further develop the model used in the Early Training Project, to disseminate information about the model, and to provide training for replicating it. Three Early Training Centers, one of the Peabody campus, one in north Nashville, and one in rural Tennessee, were used to develop and demonstrate the DARCEE model and to carry out research.

Since the opening of the first Early Training Center in March, 1966, seven groups of twenty children, equally divided by sex, have attended two of the centers for a one-year program of 40-week duration. Two groups of twenty children have attended the third center for a two-year program. Mothers are included in the program, either in a home visitor group, a classroom training program, or a variation of one of these. (See Parent Involvement.) All children and mothers involved in research projects are given pre- and posttests. Some of the following tests are administered to the children: Binet, Wechsler (WPPSI), PPVT, Verbal Language Test (local), DARCEE Concept Test (Gilmer: local). Mothers are given the Wechsler (WAIS), and the Verbal Language Test designed by DARCEE. Mothers are also videotaped teaching an assigned activity, and the videotape is later analyzed. In a 1970 manuscript, Susan W. Gray, DARCEE director, described the results as "modest but grati-

fying." The developers do not look upon the model and curriculum described in this report as the final conclusion of their research and development efforts.

What evaluation studies have been conducted?

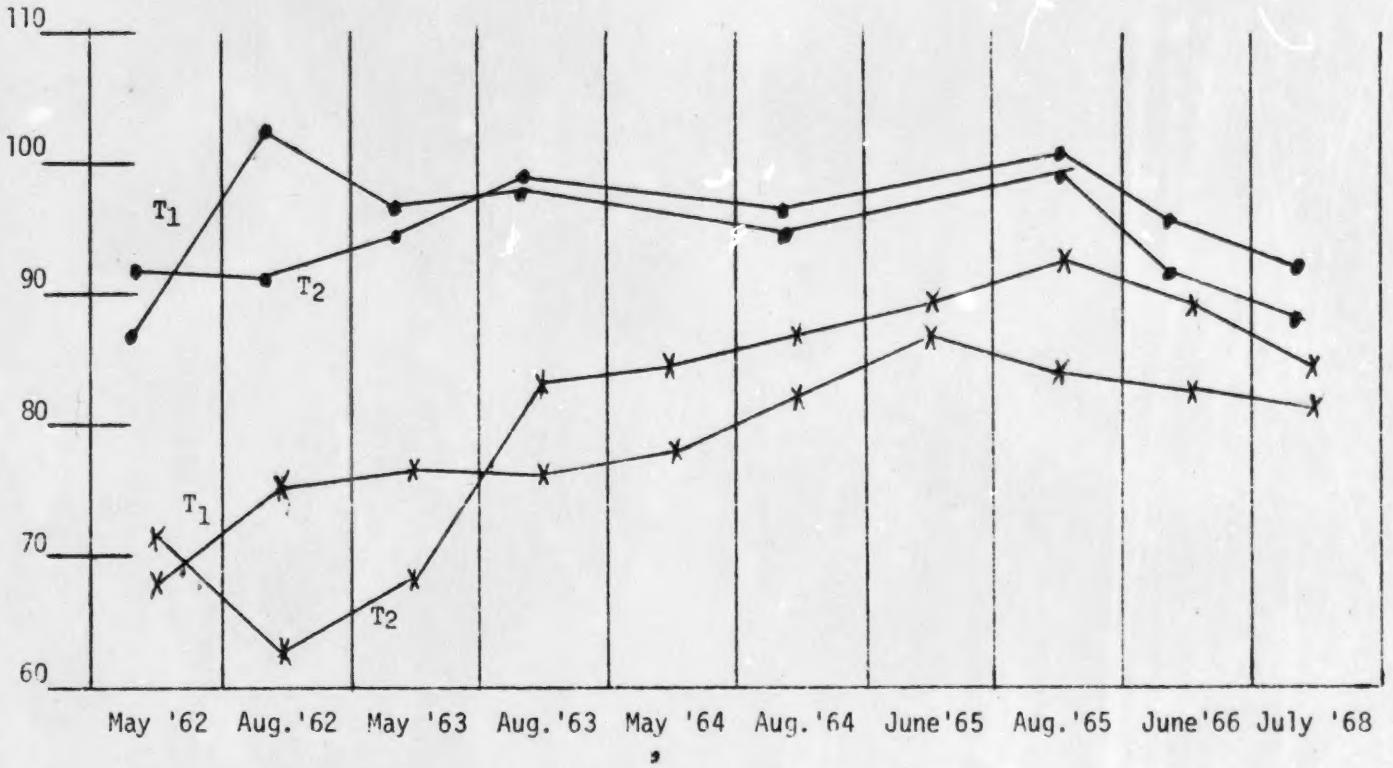
DARCEE has conducted two major evaluation studies, one following the progress of Early Training Project children through the fourth grade and the other assessing the relative effectiveness of various methods of parent training and the effects upon their younger children (the Major Intervention Study). In addition, all children involved in DARCEE programs receive pretests and posttests. As far as is known, no outside agencies have evaluated the DARCEE program.

The Early Training Project follow-up study. In December 1969 DARCEE released the report on the children in the Early Training Project at the end of the fourth grade. (See the first part of this section for a description of the project and of the children.) As described earlier, the sample of 88 children was about equally divided into four groups: (a) those who received three summer school sessions and three years of home visitor contacts, (b) those who received two years of the same treatment, (c) a local control group, and (d) a distant control group. Each group received pre- and posttests at the beginning and end of each summer school (1962 through 1964), regardless of whether they attended. They also received followup tests at the end of the first, second, and fourth grades. Prior to first grade, standardized tests of intelligence and language were used "along with a number of less formal instruments." The actual program ended in 1965. At the end of first grade (1965) achievement tests were added. In 1968 at the end of fourth grade, the Binet, the Peabody Picture Vocabulary Test, and the Metropolitan Achivement Test were administered.

The results showed that the Early Training Project caused a fairly sharp increase on the Binet and the Peabody Picture Vocabulary Test at first. In later tests the scores leveled off and slowly declined. (See the chart on the following page.) The experimental children remained "significantly superior" to the control groups on intelligence tests over the years, but there was no significant difference between the groups on language (PPVT) and achievement (Metropolitan) by the end of the fourth grade. "There is a slight but parallel decline across groups," state the developers.

The study also showed evidence of "vertical diffusion," that is, effects on younger siblings of target children from working with the mothers.

MEAN IQ EQUIVALENTS FOR TREATMENT GROUPS



T_1 = Group receiving three summer school sessions (1962, 1963, and 1964) with home visitor contacts in the winters of 1962-63, 1963-64, and 1964-65.

T_2 = Group receiving two summer school sessions (1963 and 1964) with home visitor contacts in the winters of 1963-64 and 1964-65.

Stanford-Binet

PPVT

In the conclusion of the report on the study, the developers state:

> Our answer as to whether such retardation can be offset is one of cautious optimism. The effects of our intervention program are clearly evidenced through the second year of public schooling, one year after intervention ceased. There is still an effect, most apparent in the Binet, after two more years of non-intervention. Our data on horizontal[1] and vertical[2] diffusion, especially the latter, gives us some hope that intervention programs can have a lasting effect that goes beyond the children that were the target of the intervention program.
>
> Still, it is clear from our data, with a parallel decline across the four groups in the second through fourth grades, that an intervention program before school entrance, such as ours, cannot carry the entire burden of of offsetting progressive retardation . . .
>
> . . . The most effective intervention programs for preschool children that could possibly be conceived cannot be considered a form of innoculation whereby the child forever after is immune to the effects of a low income home and of a school inappropriate to his needs. Certainly the evidence on human performance is overwhelming in indicating that such performance results from the continual interaction of the organism with its environment. Intervention programs, well conceived and executed, may be expected to make some relatively lasting changes. Such programs, however, cannot be expected to carry the whole burden of providing adequate schooling for children frm deprived circumstances; they can provide only a basis for future progress in schools and homes that can build upon that early intervention.

[1]Effects on members of the community outside the target family.
[2]Effects upon younger children in the same family.

The major intervention study. This study was aimed primarily at assessing "diffusion effects" of intervention--i.e., the spread of learning to younger siblings of the experimental children to other families in the community. The study used black subjects from a low-income housing project. There were three treatment groups of 20 mother-child pairs: (a) the Maximum Impact group, which participated in the pre-school (mothers and children) and worked with a home visitor; (b) the Home Visitor group, which had weekly contact with a home visitor but whose children did not attend the preschool; and (c) the Curriculum group, the children of which attended the preschool while the mothers received no training either at school or at home. All children involved had younger siblings. The performance of these younger siblings, now in school, has been and will be followed over several years.

The following results apply to the younger siblings of the experimental children. Using a DARCEE-developed Basic Concept Test, the two groups whose mothers participated were "significantly superior in performance" on the test to the Curriculum group and the control group. There were "no statistical differences" between the first two groups; that is, it seemed to make no difference whether the parent received both visitor contacts and classroom training or only home visitor contacts. The developers conclude that including the mother can increase the effectiveness of intervention at a modest cost.

PROGRAM HISTORY AND PRESENT STATUS

What is the history of the program?

DARCEE grew out of the Early Training Project, an intervention program begun in 1961 by faculty members of George Peabody College for Teachers in Nashville, Tennessee. The project was funded by the National Institute of Mental Health (DHEW). Dr. Susan W. Gray, Professor of Psychology at Peabody and presently director of DARCEE, co-directed the Early Training Project with Rupert A. Klaus, who is no longer with the project.

Sixty children between the ages of 3-1/2 and 4-1/2 composed the sample. The following background description is taken from *Before First Grade* (Gray, Klaus, et al):

> The children with whom we have worked live in a town of about 25,000 in the upper south; the sample is Negro. The population of the town is highly stable; during the three years of our study, for example, we lost only two of eighty-seven families. Most of the families are at least third generation in the vicinity and came originally from a predominantly agricultural background. Until quite recently opportunities for upward mobility of Negroes remaining in this city have been slight. Employment of mothers in our sample is chiefly as domestics, as kitchen help in restaurants, or as maids in beauty parlors. In the homes with fathers, workers tend to be unskilled or semi-skilled--truck drivers, porters, building custodians--a few are employed in skilled trades in construction work. Families are large, the median number of children being five; about forty percent have no fathers in the home. In most of the families responsibility for child care is shared by grandmothers, aunts, and older sisters. Our criteria for selection of families were the following: housing conditions (including furnishings and educational and cultural materials present), occupation, education of parents, and income.

The sixty children, all born in 1958, were assigned randomly to three groups. The first group had a three-year program: they attended a ten-week summer school for three years (1962, 1963, and 1964) and their mothers had regular home visitor contacts during the three periods following, including the first-grade year (winters 1962-63, 1963-64, and 1964-65). The second group had a two-year program: they started preschool a year later (at 4-1/2 rather than 3-1/2), and the home visitor contacts also began a year later. The third group was a local control group, which received neither summer schooling nor home visitor contacts. However, it was expected that in a small community the control group parents might learn from the experimental parents, thereby creating a diffusion effect; to assess this diffusion effect, a second control group was set up in a similar town 27 miles away.

The summer school had one head teacher for twenty children and one teaching assistant for each five children. The staff was balanced as to race and sex. It was believed desirable to have men teachers serving as father figures.

The home visitor program attempted to enlist the mothers to reinforce the summer school learnings in the months between. Home visitor contacts continued through first grade.

Children in all four groups, including both control groups, received pre- and posttests before and after the summer school each year. Followup tests were administered to all four groups during the first four years of regular school. Results are reported under Program Development and Evaluation.

In early 1966, the present Demonstration and Research Center for Early Education (DARCEE) was established under grants from the Office of Education and Office of Economic Opportunity to refine the model and curriculum of the Early Training Project. DARCEE's mission was threefold: demonstration, research, and training.

At present there is one DARCEE Early Training Center on the Peabody campus. Prior to fall 1970 there were two other centers, one in North Nashville and one in a rural area, Fairview, Tennessee. Both have been turned over to community groups to operate Head Start programs on the DARCEE model--one to a group working with the Tennessee Department of Labor and the other to a Community Action Program group. These centers are used in DARCEE's demonstration, research, and training programs. In addition, DARCEE has two portable buildings on campus and quarters in the Peabody Human Development Laboratory. The total DARCEE staff numbers about 55, of which 30 are professionals.

Among the major research carrierd on at DARCEE has been a study to assess the diffusion effects on younger siblings of various models (the Major Intervention Study); and two "ecological" studies, one to investigate agents in the home that act upon the child and the other to investigate teacher effectiveness. (See Program Development and Evaluation.) Other research has included such studies as one on relative effectiveness of various methods for training aides and one on the correlation between nutrition and learning (in cooperation with Vanderbilt University's Division of Nutrition).

DARCEE's training programs are of two types: career programs (such as doctoral or M.A. study) and short-term programs--institutes and inservice training for personnel planning to set up or teach in DARCEE model schools.

The model has been adapted to Head Start classes by North and South Dakota, in Indian Community Action Program Schools in Minnesota and Wisconsin, and in a Title I inner-city school in Racine, Wisconsin, among others.

DARCEE is a component of the National Program on Early Childhood Education.

What is the present state of development?

The DARCEE staff is developing eleven "resource units" which will compose a complete curriculum. Four are available as of November 1971, and the rest are expected to be published by late 1972. An introductory manual and a manual for home visitors are available now as well as a variety of reports and other documents relating to the program. All materials can be obtained free or at nominal cost from the Information Office at DARCEE. A bibliography is available on request. (See also the bibliography at the end of this report.)

During the 1971-72 school year the DARCEE model will be disseminated through the Central Midwestern Regional Educational Laboratory (CEMREL) in connection with its National Program on Early Childhood Education. Reading, Pennsylvania, Louisville, Kentucky, and the Mille Lacs, Minnesota, Chippewa reservation will be the sites for the new DARCEE model classrooms under this program.

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